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ENVIRONMENT: The Challenge of Climate Change

GREAT ENERGY SAVINGS POTENTIAL FROM A MODEST TECHNOLOGY

Developing new technologies that help limit emissions at their source can in some cases be quite simple.

Roughly 1 billion people throughout the world boil their water on cooking stoves to make it potable. In Indonesia's capital of Jakarta, it is estimated that people spend 1 percent of the city's gross domestic product on boiling drinking water. Many of the poorest people still cannot afford to do so, but will start as soon as they are able. Collectively, the consumption of energy for this basic need is tremendous.

Ultraviolet purification

An Indian water treatment company, Urminus Industries, located in Bombay, has recently started manufacturing a 15-liter-per-minute purifying device at its plant in nearby Pune. Called UV Waterworks, the device uses ultraviolet light equivalent to that of a 40-watt bulb and was invented by Indian-born Ashok Gadgil at the Lawrence Berkeley National Laboratory in Berkeley, California.

"I see the potential as absolutely enor-

mous for developing countries like India," observes Vikas Garud, a director at Urminus. "The use of energy in other purification methods, including its consumption in producing chlorine or potassium permanganate, is tremendous." The production from caustic soda of chlorine, one of the most common purifiers, is one of the most energy-intensive processes.

"The technology is in its infancy," says A. Subtamaniam, another Urminus director. "We had earlier a couple of these devices fabricated for us and installed in New Delhi and at a village adopted by the beverage company Brooke Bond in Uttar Pradesh. We have now begun making these ourselves for about 30,000 rupees [\$810]." The device can even be used in villages without electricity, with a solar photovoltaic panel, which raises its cost to 100,000 rupees.

Accord in David Greene of Lawrence Berkeley, "UV Waterworks uses approximately 20,000 times less energy than boiling over a biomass cookstove. Each unit, which can serve 1,000 people, used in place of boiling, may save up to 6.3

tons a day, or 2,300 tons a year, of carbon-equivalent if it replaces unsustainable harvested biomass."

If the unit replaces boiling over wood fuel, which is sustainably harvested, Mr. Greene calculates a saving of 2.8 tons of carbon equivalent a day, or 1,000 tons a year.

For the 500 million Chinese who currently boil their drinking water, this represents a potential saving of 510 million tons a year of carbon-equivalent greenhouse gas emissions other than carbon dioxide.

"The energy savings and corresponding equivalent carbon emissions reductions will vary with cookstove fuels and stove efficiency," says Mr. Greene. In the context of the Kyoto conference, the scientists point out, this energy-efficiency method of disinfecting water could be a way for a country to earn carbon credits.

A small thing, but efficient Mr.

Gadgil admits: "Ultraviolet water disinfection is not a new technology. However, the small-scale, energy-efficient and low-

maintenance design of UV Waterworks has created a uniquely affordable and effective device: disinfecting water using the equivalent of a 40-watt light bulb at the cost of 2 cents per ton of water treated, treating 15 liters (approximately 4 gallons) per minute, enough for 500 to 1,500 people. As a result, UV Waterworks offers the first practical means of providing many communities in developing nations with readily accessible, disinfected drinking water."



Pure water at 2 cents a ton.